EMD Chemicals Inc.
Norwood, Ohio
Project No. 0100.58.25

The Payne Firm, Inc.
Environmental Consultants

TABLE 2: Data Quality Objectives

FACILITY INVESTIGATION	DECISION TO SAMPLE	INPUTS CONSIDERED	CONTROL UNCERTAINTY
1. **Nature and Extent of Contamination:** Define the nature and extent of vertical contamination such that informed decisions can be made with respect to completing the migration of contaminated ground water under control, environmental indicator report (ground water EI), and evaluating corrective measures.	• Sample and analyze soil, ground water and surface water, as appropriate. • Obtain additional nature and extent of contamination data to support the ground water EI and the design of corrective measures. • Determine the horizontal and vertical extent of contamination.	• Previous investigations at the Facility indicate that VOCs, SVOCs, and metals are the constituents of concern. • Mobility and seasonality were considered requiring single (soil) and multiple (ground water and surface water) sampling events. • Biased sampling towards locations known to have contamination.	• Biased data set to confirm nature and extent of contamination. • Sample list consists of Appendix IX VOCs, SVOCs, and site-specific metals. • Analysis uses SW-846 standard methods at lowest detection limits achievable. • Laboratory analyses will be reported with a "CLP-Like" data package. • Analyses at ASL IV. • Uncertainty limited by close spatial and temporal coordination between soil and ground water observations, and adherence to QAPP.

FACILITY INVESTIGATION	DECISION TO SAMPLE	INPUTS CONSIDERED	CONTROL UNCERTAINTY
2. **Define Physical and Hydrogeological System:** Continue to define the site geologic/hydrogeologic model and identify the potential routes of contaminant migration.	• Perform additional stratigraphic and geotechnical engineering sampling, as needed. • Perform surface water sampling to confirm ground water infiltration pathways to sewer systems. • Conduct fate and transport modeling as necessary to support decisions. • Semi-annual sampling of ground water monitoring wells.	• Establishing the overall boundary conditions for the geologic/hydrogeologic model. • Use existing boring log and hydraulic data to confirm geological information.	• Uncertainty controlled by use of standard geological property testing methods and ASL V for non-standard methods. • Biased geotechnical samples to determine geological conditions in geological units ensure model consistency. • Ground water wells correlated to initial stratigraphic borings increase certainty in the model and will increase confidence in contaminant migration routes.
3. **Human Health/Ecological Risks:** Characterize human health risks and environmental impacts necessary to complete the ground water EI report.	• Confirm potential exposure pathways and receptors. • Sample soil, surface water, and ground water media, as appropriate, for VOCs, SVOCs, and metals.	• Detected concentrations of contaminants in on-property soil and ground water media. • Contaminants in storm sewers.	• Multiple ground water sampling locations and events provide less uncertainty in the evaluation of mobility and fate of contaminants. • Sufficient characteristics of soil source area and ground water contamination provides assurances for the level of significance of human health risks. • ASL IV analyses performed using SW-846 methods for VOCs, SVOCs, and metals. Data reported using "CLP-Like" data packages.

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4. Ground Water Environmental Indicator Determination	• Sample and analyze ground water and surface water, as appropriate. • Obtain sufficient data to support ground water plume stabilization and to assess current human exposures to contamination.	• Mobility and seasonality were considered requiring multiple (ground water) sampling events. • Detected concentrations of contaminants in on-property soil and ground water media. • Detected concentrations of contaminants in storm sewers.	• At a minimum, conduct semi-annual sampling events. • Collect QA/QC samples consistent with the QAPP. • ASL IV Analyses performed using SW-846 methods for VOCs, SVOCs, and metals. • Data reported use "CLP-Like" data packages.
5. Contaminant Fate and Transport: If necessary, determine estimates on the rate of migration of contaminants in environmental media to support the ground water EI report corrective measures evaluation.	• Define relationship between contaminant concentrations and the physical hydrogeological system. • Using existing information, and data to be collected from the proposed sampling program. • Obtain, through hydrogeologic sampling, significant transport routes and site physical parameters, such as permeability and hydraulic conductivity.	• Physical parameters related to air, surface water, and ground water transport including gradient and hydraulic conductivity. • Results of ground water transport modeling.	• Uncertainty in estimated future potential for contamination migration could be large; therefore, conservative estimates will be used for transport factors. • Comparisons with actual observations will reduce inherent uncertainties to the maximum extent practical.
6. Evaluation of Corrective Measures: Use on- and off-property data to develop and evaluate an applicable range of corrective measures.	• Sample relevant media to assess toxicity, mobility, and volume. • Sample for geotechnical engineering to characterize all geologic units. • Conduct ground water transport and fate transport modeling, as necessary.	• Existing information and knowledge. • Collection of additional data prior to design will assist in corrective action decision-making. • Geological property analyses augment evaluation of key physical parameters. • Existing information derived from ongoing interim measures.	• Uncertainty reduced through development of site geologic/hydrogeologic model, nature and extent of contamination definition, and determination of key physical parameters (addressed in Parts 1 through 4 above).